U. S. DEPARTMENT OF COMMERCE
JESSE H. JONES, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

DOUGLAS FIR PLYWOOD

(DOMESTIC GRADES)

(FOURTH EDITION)

COMMERCIAL STANDARD CS45–40

[Supersedes CS45–38]

Effective Date for New Production from August 20, 1940

A RECORDED VOLUNTARY STANDARD
OF THE TRADE

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U. S. DEPARTMENT OF COMMERCE NATIONAL BUREAU OF STANDARDS

PROMULGATION

of

COMMERCIAL STANDARD CS45–40

for

DOUGLAS FIR PLYWOOD

(DOMESTIC GRADES)

(Fourth Edition)

On August 17, 1932, manufacturers, distributors, and users of Douglas fir plywood approved the adoption of standard grading rules for the guidance of the Douglas fir plywood industry. These grading rules were accepted by the trade and promulgated as Douglas Fir Plywood, Commercial Standard CS45–33. The standard was revised in 1936 and again in 1938.

A recommended revision submitted by the Douglas Fir Plywood Association and endorsed by the standing committee was circulated on May 7, 1940, to the trade for written acceptance. The trade has since accepted and approved for promulgation by the United States Department of Commerce, through the National Bureau of Standards, the revised standard as shown herein.

The standard is effective for new production from August 20, 1940.

Promulgation recommended.

I. J. Fairchild,
Chief, Division of Trade Standards.

Promulgated.

Lyman J. Briggs,
Director, National Bureau of Standards.

Promulgation approved.

Jesse H. Jones,
Secretary of Commerce.

DOUGLAS FIR PLYWOOD

(DOMESTIC GRADES)

(Fourth Edition)

COMMERCIAL STANDARD CS45–40

PURPOSE

1. Because of the extended application of Douglas fir plywood to a large number of new uses, the following standard grading rules are offered as a universal basis of understanding in the industry. General adoption and use of this standard will facilitate procurement of the proper grade of material and the proper type as to moisture resistance for its varied uses, and provide a better understanding between buyer and seller. Architects, engineers, contractors, industrial users, and home owners will thus be able to specify their needs from nationally accepted grading standards.

SCOPE

2. These rules cover seven grades of moisture-resistant type and exterior type Douglas fir plywood: a laminated board for paneling, sheathing, concrete forms, cabinet work, and many other structural and industrial uses. In addition, there are included grade specifications for door panels, tests, standard sizes, size tolerances, reinspection rules, and nomenclature and definitions.

DEFINITION

3. Douglas fir plywood is a built-up board of laminated veneers in which the grain of each piece is at right angles to the one adjacent to it. The kiln-dried veneer is united under high pressure with a bonding agent, making the joints as strong as or stronger than the wood itself. The alternating direction of the grain with each contiguous layer of wood equalizes the strains and in this way minimizes shrinkage and warping of the product and prevents splitting.

GENERAL REQUIREMENTS

4. All Douglas fir plywood sold as of commercial standard quality shall meet the following general requirements:

5. *Workmanship.*—It shall be smoothly sanded on two sides, unless otherwise specified. It shall be well manufactured and free from blisters, laps, and defects, except as permitted in the specific rules for the various grades.

6. *Bonding.*—The entire area of each contacting surface of the plywood shall be bonded in an approved manner with material best adapted to each use classification.

7. *Loading or packing.*—It shall be securely loaded or packed to insure delivery in a clean and serviceable condition.

DETAIL REQUIREMENTS

8. Douglas fir plywood is made in two types: moisture resistant (M. Res.) and exterior (Ext.). It shall be graded according to both sides of the piece into the various grades hereinafter defined. The grade descriptions set forth the minimum requirements, and therefore the majority of panels in any shipment will exceed the specification given.

MOISTURE-RESISTANT TYPE

9. This type represents the majority of production and consists of plywood with a high degree of moisture resistance where its application requires that it shall retain its original form and practically all its strength when occasionally subjected to a thorough wetting and subsequent normal drying—a plywood suitable for construction where subjected to occasional deposits of moisture by condensation through walls or leakage or from other sources. Veneers 1/12 inch or more shall be used in the construction of moisture-resistant-type panels, ¼ inch and upward in thickness. The veneer thickness shall be measured before the panel is sanded. This type shall meet the test requirements set forth in paragraphs 27 and 28. This type is available in the following grades:

10. *Good 2 Sides* (*G2S*).—Each face shall be of a single piece of smoothly cut veneer of 100-percent heartwood, free from knots, splits, checks, pitch pockets, and other open defects. The faces shall be a yellow or pinkish color without stain. Shims that occur only at the ends of panels and inconspicuous well-matched small patches not to exceed ⅜ inch wide by 2½ inches long shall be admitted. This grade is recommended for uses where a light stain or natural finish is desired.

11. *Good 1 Side* (*G1S*).—The face shall be equal to that described under "*Good 2 Sides*" grade (par. 10), while the back shall be equal to the "*Sound 2 Sides*" grade (par. 12).

12. *Sound 2 Sides* (*S02S*).—Each face shall be of one or more pieces of firm, smoothly cut veneer. When of more than one piece, it shall be well-joined and reasonably matched for grain and color at the joints. It shall be free from knots, splits, checks, pitch pockets, and other open defects. Streaks, discolorations, sapwood, shims, and neatly made patches shall be admitted. This grade shall present a smooth surface suitable for painting.

13. *Wallboard* (*WB*).—This is a 3-ply board of ¼-inch or ⅜-inch sanded, or 5-ply, ½-inch sanded thickness, made only in standard wallboard sizes, the face of which shall be of one or more pieces of firm, smoothly cut veneer. When of more than one piece it shall be well-joined and reasonably matched for grain and color at the joints. It shall be free from knots, splits, pitch pockets, and other open defects. Streaks, discolorations, sapwood, shims, and neatly made patches shall be admitted. The face on this grade shall present a smooth surface suitable for painting. The back shall contain knothole

or pitch pockets, splits, and other defects in number and size that will not seriously affect the strength or serviceability of the panel and which cannot reasonably and economically be repaired to make a sound face. All wallboard panels shall be so designated by grade marking each panel.

14. *Sheathing. (SH).*—This is an unsanded plywood made only in the following sizes: Thicknesses 5/16 inch and 3/8 inch, 3 ply; 1/2 inch and 5/8 inch, 3 or 5 ply; widths 32 and 48 inches; length 96 inches. The face shall present a solid surface except that the following will be permitted: (*a*) Not more than six knotholes 3/8 inch or less in greatest dimension, (*b*) splits 1/16 inch or less in width, and (*c*) one or two strips of paper tape. There may be any number of patches and plugs in the face, but the face may not be of such quality that, if sanded, it will pass for a wallboard face. No belt sanding is permissible. The back shall contain solid knots, knotholes or pitch pockets, splits, and/or other defects in number and size that will not seriously affect the strength or serviceability of the panel. No tape shall be permitted in the glue line. All sheathing panels shall be scored or marked for nailing to conform to standard spacing of lumber studding.

15. *Automobile and industrial stock (rough).*—Faces of panels shall be free from knotholes. Tight knots, straight and tight checks shall be admitted. Each face shall be of one or more pieces of firm, smoothly cut veneer. Core and cross bands shall be of firm stock. Knotholes in cores and cross bands, up to 1¼ inches in diameter, are permitted.

16. *Concrete-form plywood.*—Concrete-form plywood shall be built up of three or five thicknesses of veneer, of which the two outside plies are at least 1/8-inch thick before sanding. An occasional knothole is permissible in the center or core of 5-ply panels only, but no knotholes are permitted in cross banding. Appearance of faces shall be similar to that of *"Sound 2 Sides"* grade (par. 12). The bonding agent used shall be especially prepared for this purpose and be very highly water-resistant. All concrete-form plywood shall be so designated by grade marking each panel on the face. Concrete-form plywood shall be edge-sealed, and have the faces mill-oiled, unless the order specifically states not to oil.

DOOR PANELS

(Moisture-Resistant Type)

17. *Number 1 door panel (No. 1 D. P.).*—The grade of No. 1 door panels shall be the same as for *"Good 2 Sides"* grade (par. 10).

18. *Number 2 door panel (No. 2. D. P.).*—Each face shall be of a single piece of veneer that is free of knots and other open defects, but may admit medium stain and discoloration. Patches not exceeding 5/8 by 2½ inches and shims of any size, when reasonably selected for color and grain, are admissible.

EXTERIOR TYPE

19. This type represents the ultimate in moisture resistance, a plywood that will retain its original form and strength when repeatedly wet and dried and otherwise subjected to the elements, and suitable for permanent exterior use. It shall be free from both core gaps and core voids that impair the strength or serviceability of the

panel. Only a resin-impregnated tape shall be permitted in the glue line. No veneer thicker than 5/16 inch shall be used. All exterior panels shall be so designated by a distinctive symbol "Ext." branded or stamped on the edge of each panel. Plywood of this type shall meet the test requirements set forth in paragraphs 27, and 29 or 30. This type is available in the following grades:

20. *Good 2 Sides Exterior (G2S-Ext.).*—Each face shall be of a single piece of smoothly cut veneer of 100–percent heartwood, free from knots, splits, checks, pitch pockets, and other open defects. The faces shall be a yellow or pinkish color without stain. Shims that occur only at the ends of panels and inconspicuous well-matched small patches not to exceed 3/8 inch wide by 2½ inches long shall be admitted. This grade is recommended for uses where a light stain or natural finish is desired.

21. *Good 1 Side Exterior (G1S-Ext.).*—The face shall be equal to that described under "*Good 2 Sides Exterior*" grade (par. 20), while the back shall be equal to the "*Sound 2 Sides Exterior*" grade (par. 22).

22. *Sound 2 Sides Exterior (S02S-Ext.).*—Each face shall be of one or more pieces of firm, smoothly cut veneer. When of more than one piece, it shall be well-joined and reasonably matched for grain and color at the joints. It shall be free from knots, splits, checks, pitch pockets, and other open defects. Streaks, discolorations, sapwood, shims, and neatly made patches shall be admitted. This grade shall present a smooth surface suitable for painting.

23. *Sound 1 Side Exterior (SO1S–Ext.).*—The face shall be of one or more pieces of firm, smoothly cut veneer. When of more than one piece it shall be well-joined and reasonably matched for grain and color at the joints. It shall be free from knots, splits, pitch pockets, and other open defects. Streaks, discolorations, sapwood, shims, and neatly made patches shall be admitted. The face on this grade shall present a smooth surface suitable for painting. The back shall contain knotholes not larger than 1 inch or pitch pockets, splits not wider than 3/16 inch, and other defects in number and size that will not impair the serviceability of the panel and that cannot be reasonably and economically repaired to make a sound face.

24. *Sheathing Exterior (SH.–Ext.).*—An unsanded panel the face of which shall present a solid surface except that the following will be permitted: (*a*) Not more than 6 knotholes 3/8 inch or less in greatest dimension, (*b*) splits 1/16 inch or less in width, (*c*) one or two strips of paper tape. There may be any number of patches and plugs in the face but the face may not be of such quality that, if sanded, it will pass for "*Sound 1 Side Exterior*" grade. No belt sanding is permissible. The back shall be the same as the back described under "*Sound 1 Side Exterior*" grade, (par. 23). Exterior type sheathing is made in 5/16-inch, 3/8-inch, ½-inch, and 5/8-inch thicknesses and in one standard panel size 48 inches by 96 inches.

25. *Industrial Exterior.*—Shall have two solid faces made of one or more pieces. All open defects shall be repaired, except small pitch pockets, and tight splits which are 1/16 inch or under in width. All knotholes in the face veneer shall be patched. Panels in this grade shall be lightly "touch" sanded on both sides to remove dry tape, surplus glue, etc., but the tolerance of 1/32 inch, as allowed for unsanded panels, shall apply.

26. *Concrete-form Exterior.*—Shall be the same as "*Sound 2 Sides Exterior*" (par. 22) except that faces shall be ⅛ inch thick before sanding. It is made only in ⅝ inch and ¾ inch thicknesses. All concrete-form plywood shall be so designated by grade marking each panel on the face. Concrete-form plywood shall be edge-sealed, and have the faces mill-oiled unless the order specifically states not to oil.

TESTS

27. *Sampling.*—Samples for testing shall be taken from 1 percent of the panels in any shipment, but not less than 5 and not more than 10 panels shall be selected. A test specimen shall be cut from each end, approximately at midwidth of the panel, and from each edge approximately at midlength of the panel, while a fifth sample shall be cut from somewhere near the middle or center of the panel.

28. *Test for Moisture-Resistant Type.*—Five samples 6 by 6 inches shall be taken from each test panel. They shall be submerged in

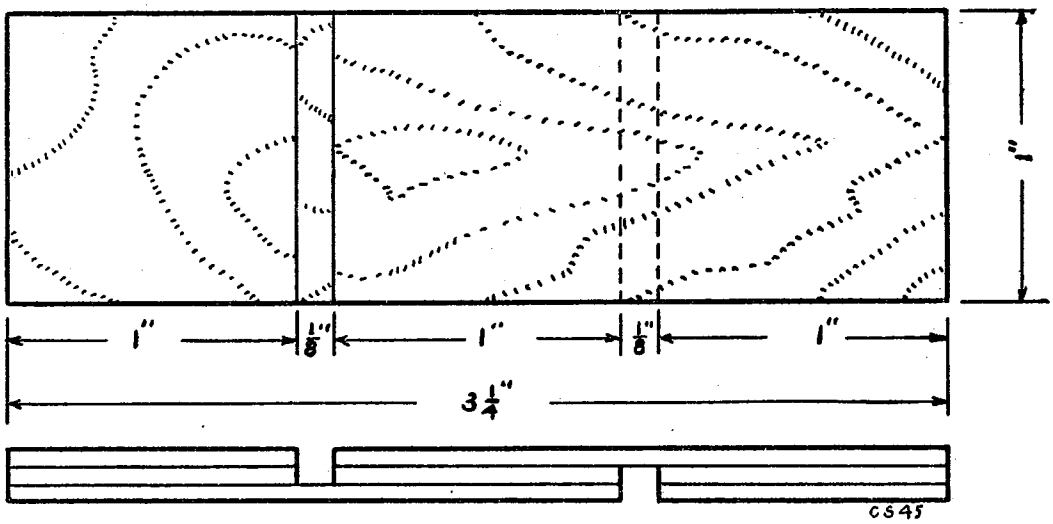

FIGURE 1.—*Test specimen.*

water at room temperature for a period of 4 hours, followed by drying at a temperature not to exceed 100° F for a period of 20 hours. This cycle shall be repeated a second time, after which the samples must show not more than 2 inches of delamination along the edge.

29. *Test for Exterior Type.*—Five samples shall be cut as shown in figure 1 from each test piece. They shall be submerged in water at room temperature for a period of 48 hours and dried for 8 hours at a temperature of 145° F (±5° F) and then followed by 2 cycles of soaking for 16 hours and drying for 8 hours under the conditions described above. The samples shall again be soaked for a period of 16 hours and tested, while wet, in a shear testing machine, as illustrated in figure 2, by placing them in the jaws of the device to which a load shall be applied at the rate of 600 to 1,000 pounds per minute until failure. The test specimens must show no less than 30-percent minimum and 60-percent average wood failure, and no delamination. If the number of plies exceeds 3, the cuts shall be made so as to test any two of the joints, but the additional plies need not be stripped, except as demanded by the limitations of the width of the retaining

jaws on the testing machines. When desired, special jaws may be constructed to accommodate the thicker plywood. If number of plies exceeds 3, the choice of joints to be tested shall be left to the discretion of the inspector, but at least one-half the tests shall include the innermost joints.

30. *Alternate Test for Exterior Type.*—An alternate test applicable at the manufacturer's option to the one mentioned above consists in taking the samples as described above and boiling them in water for 4 hours, followed by a drying of 20 hours at the above mentioned tem-

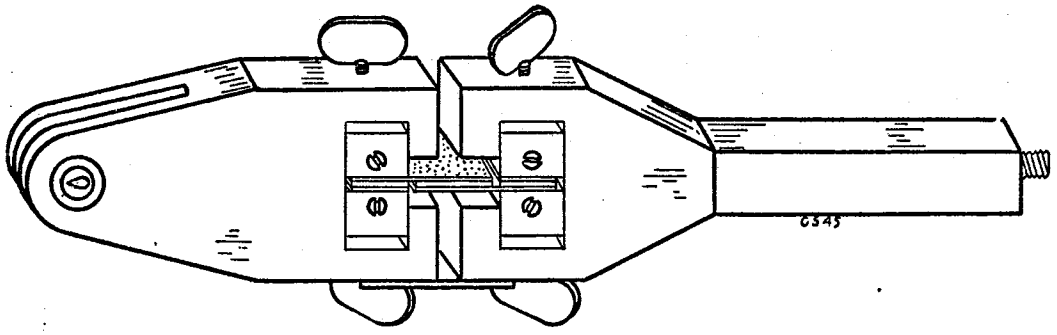

FIGURE 2.—*Jaws for shear test.*

perature. They shall be boiled again for a period of 4 hours and the samples tested while wet, as above described. The test specimens must show no less than 30-percent minimum and 60-percent average wood failure, and no delamination.

31. *Interpretation of tests.*—If there is failure of more than one test specimen from any panel, that specific panel shall be rejected. If there is a failure in any of the panels tested, five additional panels shall be selected and tested under the conditions described, and all of these five panels must pass the required test. If the panels do not pass such test, a reinspection may be demanded either by buyer or seller, as provided for in paragraphs 35 to 37.

STANDARD SIZES

32. Douglas fir plywood is made in the standard sizes listed in table 1.

TABLE 1.—*Standard Douglas fir plywood sizes*

[Moisture-resistant type]

Item	Width		Length	Thickness
	Inches	*Inches*	*Inches*	*Inches* (After sanding)
Standard panels (G2S), (G1S), (SO2S)	12 14 16 18 20 22 24	26 28 30 36 42 48	48 60 72 84 96	3/16 (3 ply) 3/4 (5 ply) 1/4 (3 ply) 13/16 (5 or 7 ply) 5/16 (3 ply) 7/8 (7 ply) 3/8 (3 ply) 15/16 (7 ply) 7/16 (5 ply) 1 (7 ply) 1/2 (5 ply) 1 1/16 (7 ply) 9/16 (5 ply) 1 1/8 (7 ply) 5/8 (5 ply) 1 3/16 (7 ply) 1 1/16 (5 ply)
Wallboard	48		60 72 84 96	1/4 (3 ply sanded 2 sides) 3/8 (3 ply sanded 2 sides) 1/2 (5 ply sanded 2 sides)
Sheathing	32 48		96	5/16 (3 ply unsanded) 3/8 (3 ply unsanded) 1/2 (3 or 5 ply unsanded) 5/8 (3 or 5 ply unsanded)
Automobile and industrial	As ordered		As ordered	1/4 (3 ply unsanded) 5/16 (3 ply unsanded) 3/8 (3 or 5 ply unsanded) 7/16 (3 or 5 ply unsanded) 1/2 (5 ply unsanded) 9/16 (5 ply unsanded) 5/8 (5 ply unsanded) 1 1/16 (5 ply unsanded) 3/4 (5 ply unsanded) 7/8 (5 or 7 ply unsanded)
Concrete form panels	Same as standard panels		Same as standard panels	1/2 (3 or 5 ply sanded 2 sides) 9/16 (5 ply sanded 2 sides) 5/8 (5 ply sanded 2 sides) 1 1/16 (5 ply sanded 2 sides) 3/4 (5 ply sanded 2 sides)

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TABLE 2.—*Standard Douglas fir plywood sizes*

[Exterior type]

Item	Width		Length	Thickness [1]
	Inches	*Inches*	*Inches*	*Inches* (After sanding)
Standard panels (G2S-Ext.), (G1S-Ext.), (S02S-Ext.), (S01S-Ext.).	12 14 16 18 20 22 24	26 28 30 36 42 48	48 60 72 84 96	3/16 (3 ply) 3/4 (5 ply) 1/4 (3 ply) 15/16 (5 ply) 5/16 (3 ply) 7/8 (7 ply) 3/8 (3 ply) 15/16 (7 ply) 7/16 (5 ply) 1 (7 ply) 1/2 (5 ply) 1 1/16 (7 ply) 9/16 (5 ply) 1 1/8 (7 ply) 5/8 (5 ply) 1 3/16 (7 ply) 1 1/16 (5 ply)
Sheathing, exterior.	48		96	5/16 (3 ply unsanded) 3/8 (3 ply unsanded) 1/2 (3 ply unsanded) 5/8 (3 ply unsanded)
Industrial, exterior.	As ordered		As ordered	1/4 (3 ply unsanded) 5/16 (3 ply unsanded) 3/8 (3 ply unsanded) 7/16 (3 ply unsanded) 1/2 (5 ply unsanded) 9/16 (5 ply unsanded) 5/8 (5 ply unsanded) 1 1/16 (5 ply unsanded) 3/4 (5 ply unsanded) 7/8 (5 ply unsanded)
Concrete-form panels, exterior	Same as standard panels		Same as standard panels	5/8 (3 ply sanded 2 sides) 3/4 (5 ply sanded 2 sides)

[1] Number of plies listed under thickness is minimum

SIZE TOLERANCES

33. A tolerance of 1/64 (0.0156) inch over or under the specified thickness shall be allowed on sanded panels and a tolerance of 1/32 (0.0312) inch on unsanded panels.

34. A tolerance of 1/32 (0.0312) inch over or under the specified length and/or width shall be allowed, but all panels shall be square within 1/8 (0.1250) inch.

INSPECTION

35. All plywood guaranteed to conform to the commercial standard grading rules is sold subject to inspection in the white only, except concrete-form material, which may have a priming of oil or other preparation before shipment. All complaints regarding the quality of any shipment must be made within 15 days from receipt thereof.

36. Where the grade of any plywood shipment is in dispute and a reinspection is demanded, the cost of such reinspection shall be borne by the seller and the shipment settled for on the basis of the reinspection report, if the shipment is more than 5 percent below grade.

37. If reinspection establishes the shipment to be 5 percent or less below grade, the buyer pays the cost of reinspection and pays for the shipment as invoiced.

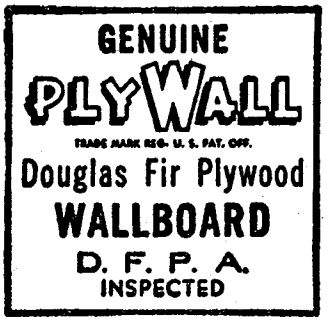
GRADE MARKING AND CERTIFICATION

38. In order to assure the purchaser that he is getting Douglas fir plywood of the grade specified, producers may individually or in concert with their trade association or Inspection Bureau, issue certificates with each shipment, or grade mark each panel as conforming to the standard.

39. The following sets forth the grade marking and certification rules adopted by the Douglas Fir Plywood Association to preserve the high standards of quality herein recorded and to insure distributors and ultimate consumers receiving the proper kind of plywood for their specific needs. All standard-size panels are stamped or branded with the following symbols:

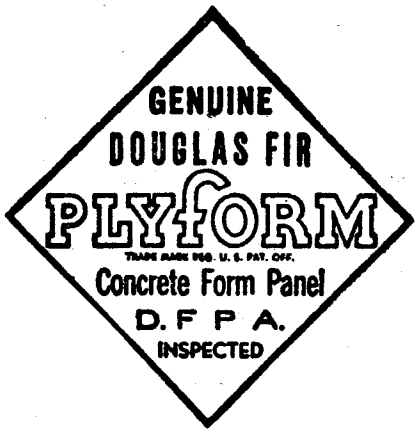
(*a*) *Standard Panels* of Good 2 Sides, Good 1 Side, and Sound 2 Sides grades are stamped or branded on one edge.

(*b*) *Wallboard* is stamped on the back.



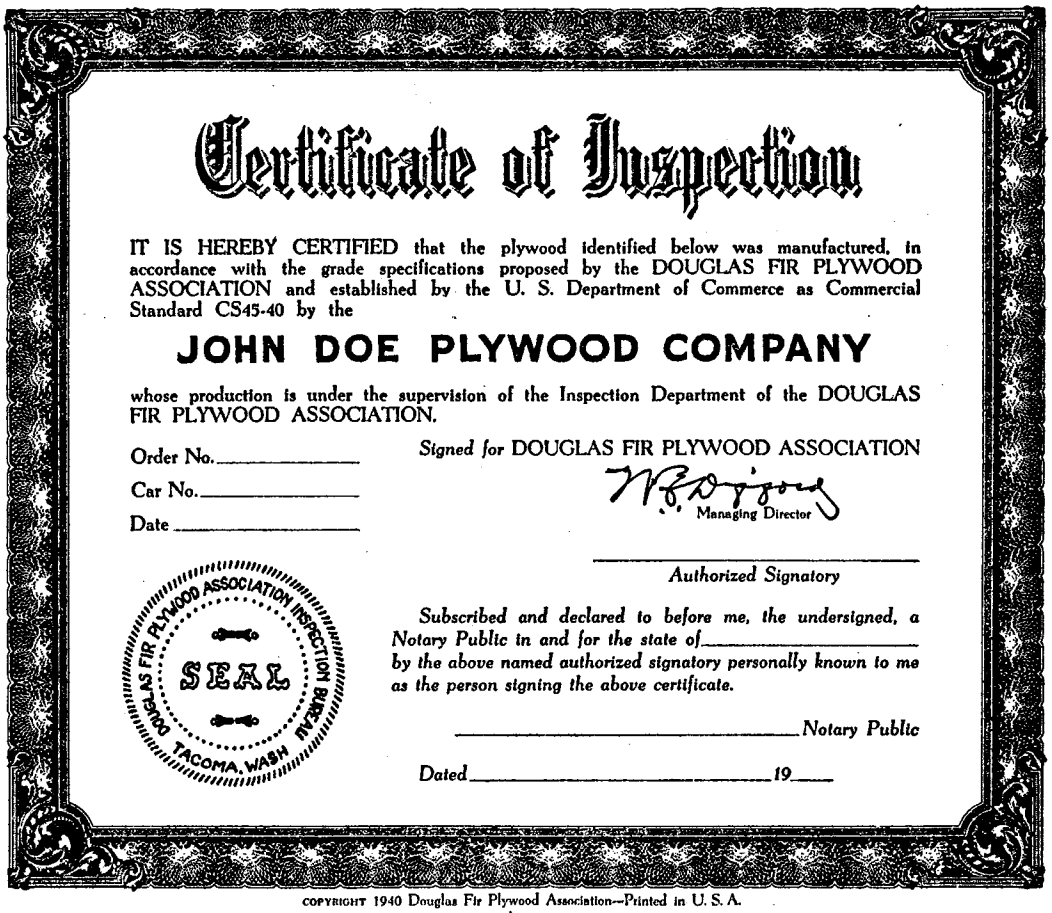
(*c*) *Sheathing* is scored in parallel lines at 16-inch intervals across the face, with the name, "PLYSCORD," repeated at frequent intervals, and also stamped in the corner of the panel.

(*d*) *Concrete-form panels* are stamped on the face.



(*e*) All *Exterior-type plywood* is stamped or branded on the edge.

40. The Douglas Fir Plywood Association maintains an Inspection Bureau for the careful grading of its members' products. By the use



Certificate of Inspection

IT IS HEREBY CERTIFIED that the plywood identified below was manufactured, in accordance with the grade specifications proposed by the DOUGLAS FIR PLYWOOD ASSOCIATION and established by the U. S. Department of Commerce as Commercial Standard CS45-40 by the

JOHN DOE PLYWOOD COMPANY

whose production is under the supervision of the Inspection Department of the DOUGLAS FIR PLYWOOD ASSOCIATION.

Order No._____

Car No._____

Date _____

Signed for DOUGLAS FIR PLYWOOD ASSOCIATION

W. B. Dougherty
Managing Director

_____
Authorized Signatory

DOUGLAS FIR PLYWOOD ASSOCIATION INSPECTION BUREAU
SEAL
TACOMA, WASH

*Subscribed and declared to before me, the undersigned, a Notary Public in and for the state of*_____ *by the above named authorized signatory personally known to me as the person signing the above certificate.*

_____ *Notary Public*

*Dated*_____ *19*____

FIGURE 3.—*Inspection certificate of the Douglas Fir Plywood Association*

of certificates on carload lots, the first unloading buyer of a carload is assured of receiving plywood of the grade specified. This is of special value to buyers of industrial grade plywood, which, because of frequent odd sizes, cannot be grade marked separately.

NOMENCLATURE AND DEFINITIONS

Back.—The side reverse to the face of the panel.

Centers.—See "*Cores.*"

Checks.—Small splits running parallel to the grain of the wood caused chiefly by strains produced in seasoning.

Cores.—Cores or centers are the innermost layer in plywood construction.

Crossbanding.—Veneer used in the construction of plywood with 5 or more plies. In 5-ply construction it is placed at right angles between the core and faces.

Defects, open.—Checks, splits, open joints, cracks, loose knots, and other defects interrupting the smooth continuity of the panel surface.

Face.—The better side of a panel in any grade calling for a face and a back; also, either side of a panel where the grading rules draw no distinction between faces.

Heartwood.—The darker-colored wood occurring in the inner portion of the tree, sometimes referred to as "heart."

Knots.—Cross section of a branch or limb whose grain usually runs at right angles to that of the piece in which it is found.

Knotholes.—Voids produced by the dropping of knots from the wood in which they were originally embedded.

Lap.—A condition where the veneers used are so misplaced that one piece overlaps the other rather than making a smooth butt joint.

Patches.—Insertions of sound wood glued and placed into panels from which defective portions have been removed.

Pitch pockets.—A pitch pocket is a well-defined opening between rings of annual growth, usually containing, or which has contained, more or less pitch, either solid or liquid.

Pitch streaks.—A pitch streak is a well-defined accumulation of pitch in a more or less regular streak.

Sapwood.—The lighter-colored wood occurring in the outer portion of the tree, sometimes referred to as "sap."

Shim.—A long, narrow patch not more than 3/16 inch wide.

Streaks.—See "*Pitch streaks.*"

METHOD OF ORDERING

The established procedure in specifying size and grade of plywood is to name the number of plies, width, length, grade, moisture resistance, finished thickness, and whether sanded or unsanded.

Width always referes to distance across the grain of the face plies; length refers to the distance along the grain. Width should always be specified first.

If, for example, you require 100 pieces of plywood ¼-inch thick, 48 inches wide, and 96 inches long, for interior or semiexposed conditions, one side of which is to be nailed against a wall where it will not show, but the other side is to be exposed to view and painted, this material should be ordered as follows:

Douglas Fir Plywood: 100 pcs., 3–ply, 48″×96″, Wallboard Grade, Moisture-resistant, Sanded 2 Sides to ¼″ thickness.

For most uses sanded panels are desirable, but there are occasional uses where unsanded panels, of a "Sound" or other grade, are satisfactory. Such panels should be specified, unsanded.

For special types of service, special features may be desirable in plywood panels, such as omission of oiling for concrete-form panels; extra-thick faces for certain architectural treatments, etc. In such cases, the special treatment or feature should be stated after the standard specification. For example, a "Standard Sound 2 Sides" panel of ⅜-inch thickness is desired for permanent exterior use. The order should read:

Douglas Fir Plywood: 100 pcs., 3–ply, 48″×96″, Sound 2 Sides, Exterior, Sanded 2 Sides to ⅜″ thickness. (Add further special requirements).

GRADE USE CLASSIFICATION FOR DOUGLAS FIR PLYWOOD

The following chart is offered by the Douglas Fir Plywood Association as a rough guide to the grades generally suitable to the various uses listed. Where the material is to be exposed to the weather, plywood of "Exterior" type should be specified.

Use	Types		Grades							
	Moisture resistant	Exterior for permanent exposure to weather	Good 2 sides	Good 1 side	Sound 2 sides	Sound 1 side (exterior only)	Wallboard (moisture resistant only)	Concrete-form panels	Sheathing	Automobile industrial stock
Amusement-park devices	X	X			X	X	X			
Archways	XXX			X			X			
Auto-body parts		X			X					X
Auto trailers	XXX	X	X		X	X				X
Base molding	X			X			X			
Benches		X			X					
Billboards		XXX			XX	X				
Bins	X	XXX			X	XX	X			
Birdhouses		XXX				X				
Boats		X	X	X	X					
Bookcases	X			X	X					
Boxes, trays, etc	XX			XX	XX					
Breakfast nooks	XX			X	X		X			
Bulletin boards	X						X			
Cabinets:										
General	X			X	X					
Ice cream	XXX			XXX	XXX					
Kitchen	XXX			XXX	XXX					
Medicine	X			X	X					
Ceilings	X						X			
Chests	XXX				X					
Church pews	XXX		X		X					
Closets	XX						XX			
Clothes chutes	X						X			
Concrete forms	X	X						X		
Counter fronts	XXX			X						
Desks	XXX			X						
Display racks	XX		X		X					
Drawers and bottoms	X				X					

Use	Types		Grades							
	Moisture resistant	Exterior for permanent exposure to weather	Good 2 sides	Good 1 side	Sound 2 sides	Sound 1 side (exterior only)	Wallboard (moisture resistant only)	Concrete-form panels	Sheathing	Automobile industrial stock
Farm buildings	X	X			X	X	X		X	
Fixtures, store	X		X	X	X					
Flooring	X			X			X			
Flower boxes		X			X					
Furniture	X	X	X	X	X					
Garages	X	X			X	X	X	X	X	
Houses, play	X	X				X		X		
Ironing boards	X			X	X					
Lockers	X				X					
Manual training uses	X	X	X	X	X		X	X		
Mirror backs	X						X			
Paneling	X	X		X		X	X			
Partitions	X		X		X					
Picnic tables		X			X		X			
Radio cabinets	X									X
Refrigerators		X			X	X				X
Screens (folding)	X		X		X					
Sheathing	X						X		X	
Shelving	X				X		X			
Siding		X			X	X				
Signs	X	X		X	X					
Subflooring	X								X	
Sun room porch	X						X			
Table tops	X	X		X		X	X			
Toys	X	X		X	X					
Trailers	X	X			X	X	X			
Trench sheeting	X	X						X		
Trunks	X				X					
Wardrobes	X				X					
Walls	X			X			X			
Window displays	X		X							
Window seats	X			X						
Window valances	X		X							
Work benches	X	X			X	X	X			

STANDING COMMITTEE

The following individuals comprise the membership of the standing committee which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Each organization nominated its own representatives. Comment concerning the standard and suggestions for revision, may be addressed to any member of the committee or to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the committee.

PHILIP GARLAND (chairman), Oregon-Washington Plywood Co., 1549 Dock St., Tacoma, Wash.

CRAIG SPENCER, Elliott Bay Mill Co., 600 W. Spokane St., Seattle, Wash.

NELSON S. PERKINS, Douglas Fir Plywood Association, Tacoma Bldg., Tacoma, Wash.

NORMAN O. CRUVER, The Wheeler Osgood Sales Corporation, 1216 St. Paul Ave, Tacoma, Wash.

CHARLES W. JACOB, John Bader Lumber Co., 2020 Clybourne Ave., Chicago, Ill.

WALTER JUNGE, Technical Division, Federal Housing Administration, Washington, D. C.

EFFECTIVE DATE

The standard is effective for new production from August 20, 1940.

HISTORY OF PROJECT

Pursuant to a request from the manufacturers of Douglas fir plywood, a general conference of manufacturers, distributors, and users of the product was held at the Winthrop Hotel, Tacoma, Wash., on August 17, 1932, to consider the adoption of standard grading rules for the guidance of the industry.

Manufacturers representing approximately 80 percent of the production of Douglas fir plywood were in attendance as well as others interested in the distribution and use of the product.

The proposed standard tentatively drafted by a committee of manufacturers was thoroughly discussed and several constructive changes were made.

Following written acceptance by a satisfactory majority the standard was promulgated as CS45–33, effective February 15, 1933.

First revision.—The standing committee as a result of an industry conference held in Tacoma, Wash., on August 3, 1936, recommended some modifications. The recommended revision was circulated on September 11, 1936, for written acceptance with the result that the revised standard was accepted and authorized by the industry for publication as Douglas Fir Plywood (Domestic Grades), (Second Edition), Commercial Standard CS45–36, effective November 1, 1936.

Second revision.—Agreeable to a suggestion from the Federal Housing Administration, and following several conferences between representatives of the Forest Products Laboratory, the FHA, and the plywood manufacturers, a second revision, so as to provide for two classes of moisture resistance and changes in the sheathing grade, was proposed. On approval by the standing committee, this revision was circulated September 16, 1938, for acceptance. Following acceptance by a satisfactory majority, the success of the revision was announced on October 25, 1938, and the standard became effective for new production on November 10, 1938, as CS45–38.

Third revision.—A general demand for the various grades of Douglas fir plywood as manufactured for permanent exterior use, led to the submission of a proposed revision by the Douglas Fir Plywood Association, to include detail requirements in the standard for seven distinct grades of the Exterior Type. Upon approval by the standing committee, the recommended revision was submitted on May 7, 1940, to the trade for written acceptance. Following acceptance by a satisfactory majority, the establishment of the revision was announced on July 20, 1940, becoming effective for new production on August 20, 1940, as CS45–40.

CS45–40

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date_____

Division of Trade Standards,
National Bureau of Standards,
Washington, D. C.

Gentlemen:

Having considered the statements on the reverse side of this sheet, we accept the Commercial Standard CS45–40 as our standard of practice in the

Production [1] Distribution [1] Use [1]

of Douglas fir plywood (domestic grades).

We will assist in securing its general recognition and use and will cooperate with the standing committee to effect revisions of the standard when necessary.

(Cut on this line)

Signature of individual officer_____
(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer_____

Organization_____
(Fill in exactly as it should be listed)

Street address_____

City and State_____

[1] Please designate which group you represent by drawing lines through the other two. Please file separate acceptances for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade papers, colleges, etc., desiring to record their general approval, the words "in principle" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities, nationally recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations and individuals listed below have accepted these grading rules as their standard of practice in the production, distribution, and use of Douglas fir plywood for the domestic trade. Such endorsement does not signify that they may not find it necessary to deviate from the standard, nor that producers so listed guarantee all of their products in this field to conform with the requirements of this standard. Therefore, specific evidence of quality certification should be obtained where required.

ASSOCIATIONS

American Specification Institute, Chicago, Ill.
Arizona Retail Lumber & Builders Supply Association, Inc., Phoenix, Ariz.
Associated General Contractors of America, Inc., Washington, D. C.
Building Officials Conference of America, Washington, D. C.
California Redwood Association, San Francisco, Calif. (In principle.)
Carolina Lumber & Building Supply Association, Charlotte, N. C. (In principle.)
Central Ohio Lumber Institute, Columbus, Ohio.
Douglas Fir Plywood Association, Tacoma, Wash. (In principle.)
Hardwood Dimension Manufacturers Association, Inc., Louisville, Ky. (In principle.)
Michigan Retail Lumber Dealers Association, Lansing, Mich.
Mississippi Retail Lumber Dealers Association, Inc., Jackson, Miss.
Mountain States Lumber Dealers Association, The, Denver, Colo.
National Association of Purchasing Agents, New York, N. Y.
National Hardwood Lumber Association, Chicago, Ill. (In principle.)
National Oak Flooring Manufacturers Association, Memphis, Tenn.
North West Woodwork Association, St. Paul, Minn. (In principle.)
Northeastern Retail Lumbermens Association, Rochester, N. Y.
Structural Service Bureau, Philadelphia, Pa.
Virginia Building Material Association, Richmond, Va. (In principle.)
West Coast Lumbermen's Association, Seattle, Wash. (In principle.)
Wisconsin Retail Lumbermens Association, Milwaukee, Wis.

FIRMS

Aberdeen Plywood Co., Aberdeen, Wash.
Ackerman & Associates, F. L., New York, N. Y.
Adams, Franklin O., Tampa, Fla.
Aetna Plywood & Veneer, Chicago, Ill.
Allen, Harris C., San Francisco, Calif.
Altfillisch, Charles, Decorah, Iowa.
American Door & Manufacturing Co., Hoquiam, Wash.
American Houses, Inc., New York, N. Y.
American Lumberman, Seattle, Wash.
American Plywood Corporation, New London, Wis.
Anderson Box & Basket Co., Henderson, Ky.
Andrews, Jones, Biscoe & Whitmore, Boston, Mass.
Andrews Lumber Co., C. E., New Bethlehem, Pa.
Antrim Lumber Co., St. Louis, Mo.
Arizona Sash Door & Glass Co., Phoenix, Ariz.
Armstrong-Walker Lumber Co., Terre Haute, Ind.
Atlanta Oak Flooring Co., Atlanta, Ga.
Austin & Shambleau, South Bend, Ind.
Bader Lumber Co., John, Chicago, Ill.
Bailey Lumber Co., Bluefield, W. Va.
Baldridge Lumber Co., J. C., Albuquerque, N. Mex.
Barnes Lumber Co., W. F. & J. F., Waco, Tex.
Bateman, William, San Francisco, Calif.
Baumer, Herbert, Columbus, Ohio.
Beacham & LeGrand, Greenville, S. C.
Beasley & Sons Co., Nashville, Tenn.
Becker Coal & Builders' Supply Co., Wilmington, N. C.
Becker Danowitz Co., Inc., Brooklyn, N. Y.
Beeson, Carroll O., Crawfordsville, Ind.
Bennett Bailey Lumber Co., Minneapolis, Minn.

Bennett Lumber Corporation, North Tonawanda, N. Y.
Bial, George F., Hasbrouck Heights, N. J.
Binswanger & Co., Inc., Richmond, Va., and Columbia, S. C.
Bishop, Horatio W., Los Angeles, Calif.
Black Millwork & Lumber Co., Inc., Midland Park, N. J.
Blithe, Wesley Lesher, Philadelphia, Pa.
Bogner, Harry, Milwaukee, Wis.
Bosman & Casson, Inc., Harrison, N. J.
Botsford Lumber Co., Winona, Minn.
Brainerd, Harry B., New York, N. Y. (In principle.)
Braseth & Houkom, Fargo, N. Dak.
Brattin & Son, F. J., Shepherd, Mich.
Brazer, Clarence W., New York, N. Y.
Briggs Co., L. W., Worcester, Mass.
Brown, William Jay, Cedar Rapids, Iowa.
Brown, Wheelock, Harris, Stevens, Inc., New York, N. Y.
Bruett Lumber, Inc., T. A., Milwaukee, Wis.
Brust & Brust, Milwaukee, Wis.
Buechner & Orth, St. Paul, Minn. (In principle.)
Buffalo Plywood Corporation, Buffalo, N. Y.
Buffelen Lumber & Manufacturing Co., Atlanta, Ga., and Tacoma, Wash.
Buhrman Pharr Hardware Co., Texarkana, Ark.
Builders Supply Co., Bismarck, N. Dak.
Burritt Co., The A. W., Bridgeport, Conn.
Burrow Lumber Co., Canyon and Happy, Tex.
Byron Sash & Door Co., Inc., Louisville, Ky.
C–W Plywood Co., Chicago, Ill.
California Panel & Veneer Co., Los Angeles, Calif.
Cameron & Co., Inc., Wm., Waco, Tex.
Cameron Lumber Co., Inc., Newburgh, N. Y.
Camp Plywood Co., Inc., the E. W., Cincinnati, Ohio, and Indianapolis, Ind.
Campbell-Smith-Ritchie Co., Lebanon, Ind.
Cannon & Mullen, Salt Lake City, Utah.
Carr, Adams & Collier Co., Dubuque, Iowa.
Carroll Lumber Co., Inc., The, Alexandria, La.
Cavalier Corporation, Chattanooga, Tenn.
Central City Lumber & Manufacturing Co., Central City, Ky.
Charlottesville Lumber Co., Inc., Charlottesville, Va.
Chesebro Whitman Co., Inc., Long Island City, N. Y.
Chicago & Riverdale Lumber Co., Chicago. Ill.
Chicago Trim & Plywood Co., Chicago, Ill.
Child, Harry Charles, Sayre, Pa.
Churchill Cabinet Co., Chicago, Ill.
Cincinnati Butchers' Supply Co., The, Cincinnati, Ohio.
Clark, Carl W., Cortland, N. Y.
Clear Fir Lumber Co., Tacoma, Wash.
Cleary Millwork Co., Inc., Ansonia, Conn.
Cleveland Railway Co., Cleveland, Ohio.
Collier-Adams Manufacturing Co., St. Joseph, Mo.
Collier-Barnett Co., The, Toledo, Ohio.
Colorado State Highway Department, Denver, Colo.
Comfort Coal-Lumber Co., Hackensack, N. J.
Conrad & Cummings, Binghamton, N. Y.
Conrad Lumber Co., De Land, Fla.
Construction Supply Co., Los Angeles, Calif.
Conwell & Co., E. L., Philadelphia, Pa.
Coolbaugh & Son Co., C. C., Gloucester City, N. J.
Coolerator Co., Duluth, Minn.
Cooper, David M., Ambridge, Pa.
Cooper, W. E., Los Angeles, Calif.
Cooperative Community Builders, Inc., Milwaukee, Wis.
Cooperative Grange League Federation Exchange, Inc., Ithaca, N. Y.
Corddry Co., The, Snow Hill, Md.
Corduan Manufacturing Co., Inc., Chicago, Ill.
Corlett, Will G., Oakland, Calif. (In principle.)
Corunna Manufacturing Co., Corunna, Mich.
Cowan & Co., Inc., H. D., Los Angeles, Calif.
Cram & Ferguson, Boston, Mass.
Cromar, H. L., Salt Lake City, Utah.
Crompton & Knowles Loom Works, Worcester, Mass.
Cronin, John, Boston (24), Mass.
Crowell & Lancaster, Bangor, Maine.
Cunningham, Lamb & Prince, Inc., Charlestown, Mass.
Curran Bros., Pomona, Calif.
Curtis Companies, Inc., Clinton Division, Clinton, Iowa.
Cuthbert & Cuthbert, Ann Arbor, Mich.
Dakota Sash & Door Co., Aberdeen, S. Dak.
Davis Hardwood Co., San Francisco, Calif.
Davis Plywood Corporation, The, Columbus, Ohio.
De Jarnette, Charles Wagner, Des Moines, Iowa.
Derr Co., Wm. H., Philadelphia, Pa.
Detroit Store Fixture Co., Detroit, Mich.

Dibble Lumber Co., The S. B., North Adams, Mass.
Dickerson Lumber Co., Huntington, W. Va.
Dietel, George J., Buffalo, N. Y.
District of Columbia, Washington, D. C.
Dix Lumber Co., Cambridge, Mass.
Dodge & Morrison, New York, N. Y.
Donlin-Johnson Co., Saint Cloud, Minn.
Donovan, John J., Berkeley, Calif.
Dougherty Lumber Co., The, Cleveland, Ohio.
Dover Lumber Co., Dover, N. J.
Dower Lumber Co., John, Tacoma, Wash.
Durable Door Co., Hoquiam, Wash.
Durez Plastics & Chemicals, Inc., North Tonawanda, N. Y.
Dykes Lumber Co., New York, N. Y.
Easley Lumber Co., Easley, S. C.
East Coast Lumber & Supply Co., Fort Pierce, Fla.
Edison, Inc., Thomas A., West Orange, N. J.
Elliott Bay Mill Co., Seattle, Wash.
Emery Industries, Inc., Cincinnati, Ohio.
Empire Sash & Door Co., Ltd., The, Winnipeg, Manitoba, Canada.
English, Harold T., Hutchinson, Kans.
Evans & Co., H. C., Chicago, Ill.
Evans-Lee Co., Eau Claire, Wis.
Evans MacArthur Co., New York, N. Y.
Evansville Sash & Door Co., Inc., Evansville, Ind.
Everett & Associates, H. F., Allentown, Pa.
Exchange Lumber Co., Inc., Rochester, N. Y.
Exchange Lumber & Manufacturing Co., Spokane, Wash.
Farley & Loetscher Manufacturing Co., Dubuque, Iowa.
Ferguson Bros. Manufacturing Co., Hoboken, N. J.
Fessenden Hall, Philadelphia, Pa.
Fink & Schindler Co., The, San Francisco, Calif.
Flannagan, Eric G., Henderson, N. C.
Flint Sash & Door Co., Inc., Flint, Mich.
Florida Institutions of Higher Learning, Board of Control of, Gainesville, Fla.
Florida, University of, School of Forestry, Gainesville, Fla.
Foltz & Son, Herbert, Indianapolis, Ind.
French Co., E. L., Detroit, Mich.
Fuller & Co., W. P., Boise, Idaho, and other cities.
General Millwork Corporation, Utica, N. Y.
Georgia Show Case Co., Montgomery, Ala.
Gibbs Lumber Co., Anaheim, Calif.
Goshen Veneer & Panel Co., Goshen, Ind.
Graton & Born, Boston, Mass.
Great Lakes Sash & Door Co., The, Cleveland, Ohio.
Grogan-Robinson Lumber Co., Great Falls, Mont.
Hager & Cove Lumber Co., Lansing, Mich.
Hahn, Stanley W., Silver Spring, Md.
Haley Bros., Santa Monica, Calif.
Hallack & Howard Lumber Co., The, Denver, Colo.
Hallberg & Beersman, Chicago, Ill.
Hamilton Lumber Co., The, Hamilton, Ohio.
Haralson & Mott, Fort Smith, Ark.
Harbor Plywood Corporation, Hoquiam, Wash., and San Francisco, Calif.
Harbor Sales Co., Inc., Baltimore, Md., and Washington, D. C.
Hardin Sash & Door Co., H. H., Fort Worth, Tex.
Harper & West, Boston, Mass.
Hartung & Hansen, Inc., Seattle, Wash.
Hawkeye Lumber Co., Oskaloosa, Iowa.
Hawkins Lumber & Warehouse Co., Boston, Mass.
Haxby & Bissell, Minneapolis, Minn.
Heidritter Lumber Corporation, Elizabeth, N. J.
Helfensteller, Hirsch & Watson, Saint Louis, Mo.
Helmle, Henry R., Springfield, Ill.
Henrich Panel Co., Inc., Buffalo, N. Y.
Henshaw Refrigeration & Fixture Co., San Francisco, Calif.
Heyer Sons, W. H., Summer, Iowa.
Heynen Lumber Co., Columbus, Nebr.
Higgins, Charles H., New York, N. Y.
Higgins Lumber Co., J. E., San Francisco, Calif.
Hinckley Lumber Co., The Dwight, Cincinnati, Ohio.
Hinckley & Son Co., John, Yarmouthport and Hyannis, Mass.
Hinshaw Lumber Co., J. F., Gering, Nebr.
Hoffman Lumber Co., Pittsburgh, Pa.
Hoit, Price & Barnes, Kansas City, Mo.
Hoke, Karl B., Toledo, Ohio.
Hope, Frank L., Jr., San Diego, Calif.
Hopkins, Albert Hart, Buffalo, N. Y.
Houston Show Case & Manufacturing Co., Houston, Tex.
Huber-Lanctot Housewrecking Corporation, Buffalo, N. Y.
Hudson Lumber, Inc., Akron, Ohio.
Humphrey-Horsley Co., Inc., New York, N. Y.
Hunter Lumber Co., Chillicothe, Ill.
Hutchings, E. T., Louisville, Ky.
Independent Lumber Co., The, Grand Junction, Colo.
Industrial Wholesale Lumber Co., Cleveland, Ohio.
Inland States Testing Laboratory, Dubuque, Iowa. (In principle.)
Interstate Lumber Co., Missoula, Mont.

Iowa Builders Supply Co., Cedar Rapids, Iowa.
Iron City Sash & Door Co., Pittsburgh, Pa.
Iroquois Millwork Corporation, Albany, N. Y.
Jefferson Wood Products Co., Jefferson, Wis.
Johnson, Keplar B., Seattle, Wash.
Johnson & Lundgren, Tacoma, Wash.
Johnson, Wallwork & Dukehart, Portland, Oreg.
Johnson & Wimsatt, Inc., Washington, D. C.
Johnstone, Harry Inge, Mobile, Ala.
Jokel-Coy-Thal, Toledo, Ohio.
Jones Hardwood Co., San Francisco, Calif.
Kaelber, Wm. G., & L. A. Waasdorp, Rochester, N. Y.
Keich & O'Brien, Warren, Ohio.
Kellogg & Sons Co., Charles C., Utica, N. Y.
Kelly, Frederic P., New York, N. Y.
Kimball Lumber Co., Watertown, Mass.
King Lumber Co., The, Bakersfield, Calif.
Knighton & Howell, Portland, Oreg.
Knox & Toombs, Hoquiam, Wash.
Koch Refrigerators, North Kansas City, Mo.
Koehl & Son, Inc., John W., Los Angeles, Calif.
Kohn, Robert D., Chas. Butler, New York, N. Y.
Kruckemeyer & Strong, Cincinnati, Ohio.
Kullberg Manufacturing Co., Minneapolis, Minn.
Kyle, Herbert S., Charleston, W. Va.
LaCrosse Lumber Co., Louisiana, Mo.
Lake Washington Shipyards, Houghton, Wash.
Lambert Lumber Co., Leavenworth, Kans.
Larrick, Thomas, Athens, Ohio.
Laucks, Inc., I. F., Seattle, Wash. (In principle.)
Lawrence, Holford & Allyn, Portland, Oreg.
Levy, Will, Saint Louis, Mo.
Lewis Lumber Co., Spring Lake, N. J.
Liberty Lumber & Manufacturing Co., Inc., Erwin, Tenn.
Liggett Drug Co., Inc., New York, N. Y.
Lloyd & Son, Ltd., C., Wingham, Ontario, Canada.
Lockhart International, Inc., New York, N. Y. (In principle.)
Lockman, Frederick V., Portland, Oreg.
Loeb, Laurence M., White Plains, N. Y.
Loetscher & Burch Manufacturing Co., Des Moines, Iowa.
Long Wall Co., York, Ala.
Los Angeles, City of, Los Angeles, Calif.
Los Angeles, Housing Authority of the County of, Los Angeles, Calif.
Lowell-Denniston Lumber Co., Eldora, Iowa.
Lumber Dealers Supply Co., Cheyenne, Wyo.
Lumber Dealers Supply Co., Denver, Colo.
Lumber & Millwork Co. of Philadelphia, The, Philadelphia, Pa.
Lumbermen's Reserve Supply Co., Des Moines, Iowa.
Lumbermen's Supply, Inc., Sacramento, Calif.
Lyman-Hawkins Lumber Co., The, Akron, Ohio.
Lyon-Gray Lumber Co., Dallas, Tex.
Lyon Metal Products, Inc., Aurora, Ill.
M. & M. Woodworking Co., Portland, Oreg.
Mahlstedt Allied Materials, Inc., New Rochelle, N. Y.
Mann & Co., Hutchinson, Kans.
Maris Plywood Corporation, San Francisco, Calif.
Markland Contracting Co., M. B., Atlantic City, N. J.
Marsh & Truman Lumber Co., Chicago, Ill.
Marshall-Wright Lumber Co., Inc., Ionia, Mich.
Martin & Son, A. Oscar, Doylestown, Pa.
Mason City Millwork Co., Mason City, Iowa.
Mason & Co., George D., Detroit, Mich.
Mason Lumber Co., Jacksonville, Fla.
Mason & Sons, Inc., A., Peru, N. Y.
Massena & duPont, Wilmington, Del.
Massey Concrete Products Corporation, Chicago, Ill.
Mauk Seattle Lumber Co., Seattle, Wash.
Mauran, Russell, Crowell & Mullgardt, Saint Louis, Mo.
McCann-Erickson, Inc., Portland, Oreg.
McCoy & Co., Inc., Lawrence R., Worcester, Mass.
McCray Refrigerator Co., Kendallville, Ind.
McGowin-Lyons Hardware & Supply Co., Mobile, Ala.
McMillen Co., The R., Oshkosh, Wis.
McPhillips Manufacturing Co., Mobile, Ala.
Mentor Lumber & Supply Co., The, Mentor, Ohio.
Michigan Wholesalers, Inc., Jackson, Mich.
Midwest Lumber Co., Dubuque, Iowa.
Mid-West Lumber Co., The, Mankato, Kans.
Miles Lumber & Coal Co., A. W., Livingston, Mont.
Millard, Julian, Harrisburg, Pa. (In principle.)
Miller & Yeager, Terre Haute, Ind.
Molther, F. R. Ancon, Canal Zone.
Montgomery Ward & Co., Chicago, Ill.
Moore, Alvin Roger, Atlanta, Ga.

Moore Dry Dock Co., Oakland, Calif.
Moore Lumber Co., L. A., Mason City, Iowa.
Mooser, William, San Francisco, Calif.
Morgan Millwork Co., Baltimore, Md.
Morrill & Sturgeon Lumber Co., Portland, Oreg.
Morrison-Merrill & Co., Salt Lake City, Utah.
Mowry & Co., Inc., Geo., Derry, Pa.
Mueller, Frederick G., & Walter R. Hair, Hamilton, Ohio.
Muhlenberg Bros., Reading, Pa.
Muhlenberg, Yerkes & Muhlenberg, Reading, Pa.
Nash-Kelvinator Corporation, Nash Division, Detroit, Mich.
Nassau Suffolk Lumber & Supply Corporation, Amityville, N. Y.
National Plywoods, Inc., Chicago, Ill.
National Plywood Co., Inc., New York, N. Y.
National Refrigerators Co., Saint Louis, Mo.
National Wood Works, Sioux City, Iowa.
Neal-Blun Co., Savannah, Ga.
Nelson, Albert L., Saint Louis, Mo.
New Castle Products, New Castle, Ind.
New England Box Co., The, Greenfield, Mass.
New Orleans, Inc., Better Business Bureau of, New Orleans, La. (In principle.)
New York Central System, New York, N. Y.
New York Wood Working Corporation New York, N. Y.
Nicolai Door Sales Co., San Francisco, Calif.
Northern Lumber Co., Billings, Mont.
Northwest Door Co., Tacoma, Wash.
Norton & Son, F. S., Algona, Iowa.
Nurenburg, W. S., Fort Worth, Tex.
O & N Lumber Co., Menomonie, Wis.
Officer, Gwynn, Berkeley, Calif.
Oklahoma, University of, Norman, Okla.
Olympia Veneer Co., Inc., Olympia, Wash.
Omaha Fixture & Supply Co., Omaha, Nebr.
Omaha Hardwood Lumber Co., Omaha, Nebr., and Sioux City, Iowa.
Oregon-Washington Plywood Co., Tacoma, Wash.
Ostlund, & Johnson, San Francisco, Calif.
Pacific Mutual Door Co., Los Angeles, Calif., and other cities.
Pacific National Lumber Co., Tacoma, Wash.
Pacific System Homes, Inc., Los Angeles, Calif.
Packing & Shipping, New York, N. Y.
Pancoast, Russell T., Miami Beach, Fla.
Parsons Cabinet Shop, R. L., Decatur, Ala.
Patten-Blinn Lumber Co., Los Angeles, Calif.
Peerless Built-In Fixture Co., Berkeley, Calif.
Pehrson, G. A., Spokane, Wash.
Pennsylvania State College, Department of Forestry, State College, Pa. (In principle.)
People's Planing Mill (Cole Brothers, Proprietors), Punxsutawney, Pa.
Portsmouth Lumber Corporation, Portsmouth, Va.
Powe Lumber Co., Thomas E., Saint Louis, Mo.
Practical Lumberman, The, Seattle, Wash. (In principle.)
Queen City Sash & Door Co., The, Cincinnati, Ohio.
Quigley Co., J. R., Gloucester City, N. J.
Radford & Sanders, Inc., Baltimore, Md.
Reid, William H., Jr., Billings, Mont.
Reynolds Lumber Co., The, New London, Ohio.
Richardson Phelps Lumber Co., Grinnell, Iowa.
Rindge & Rindge, Grand Rapids, Mich.
Risser Lumber Co., Art, Paris, Ill.
Ritchie & Associates, James H., Boston, Mass.
Robert & Co., Inc., Atlanta, Ga.
Roberts Harbor Plywood Co., Pittsburgh, Pa.
Robinson Manufacturing Co., Everett, Wash.
Rockwell Bros. & Co., Houston, Tex.
Rockwell Lumber Co., Houston, Tex.
Roddis Lumber & Veneer Co., Milwaukee, Wis.
Roddis Panel & Door Co., Cincinnati, Ohio.
Rogers Lumber Co., The, T. H., Oklahoma City, Okla.
Rohrer Lumber Co., D. J., Clintonville, Wis.
Rounds & Porter Co., Wichita, Kans.
Rowley & Associates, Inc., Charles Bacon, Cleveland, Ohio.
Rust Sash & Door Co., Kansas City, Mo.
Saint Louis, Board of Education of the City of, Saint Louis, Mo.
Sash, Door & Glass Corporation, Richmond, Va.
Scamell, Ralph E., Topeka, Kans.
Schaeffler, Joseph C., New York, N. Y.
Schiefer & Sons, San Diego, Calif.
Schirmer, R. F., Woodhaven, N. Y.
Schoeppe, Edward, Philadelphia, Pa.
Schuette Co., William, Pittsburgh, Pa.
Scott Lumber Co., The, Bridgeport, Ohio.
Sears, Roebuck & Co., Chicago, Ill.
Segelke & Kohlhaus Co., La Crosse, Wis.
Shaver, Chas. W., Salina, Kans.
Shenk Co., Henry, Erie, Pa.

Shire, Edward I., New York, N. Y.
Shutts & Morrison, Erie, Pa.
Sidells, Arthur F., & Ellis M. Keppel, Warren, Ohio.
Simons Lumber Co., Henry, Minneapolis, Minn.
Sirrine & Co., J. E., Greenville, S. C.
Sitterding-Carneal-Davis Co., Inc., Richmond, Va.
Smith Co., The Allen A., Toledo, Ohio.
Smith, Hinchman & Grylls, Inc., Detroit, Mich.
Smith & Sons, J. E., Philadelphia, Pa.
Smith Wood-Products, Inc., Coquille, Oreg.
Snell Sash & Door Co., Saint Paul, Minn.
Snellstrom Lumber Co., Eugene, Oreg.
Solie Lumber Co., Janesville, Wis.
Sones Lumber Co., El Centro, Calif.
Sothman Co., The, Grand Island, Nebr.
South Side Lumber & Supply Co., The, Toledo, Ohio.
Southern California, University of, Los Angeles, Calif.
Southwestern Sash & Door Co., Inc., El Paso, Tex.
Southwestern Sash & Door Co., Inc., Albuquerque, N. Mex.
Southwestern Sash & Door Co., Inc., Joplin, Mo.
Southwestern Veneer Co., Cotton Plant, Ark.
Sowers-Benbow Lumber Co., Columbus, Ohio.
Spahn & Rose Lumber Co., Dubuque, Iowa.
Sparks-Withington Co., The, Radio Division, Jackson, Mich.
Spear Lumber Co., Provo, Utah.
Specification Record, Chicago, Ill.
Standard Lumber Co., Spokane, Wash.
Start, Cedric, Hollywood, Fla.
Statesir Lumber Co., Ltd., Freehold, N. J.
Staub, John F., Houston, Tex.
Sterling Lumber & Investment Co., The, Denver, Colo.
Steves Sash & Door Co., San Antonio, Tex.
Stockton Lumber Co., Inc., Stockton, Calif.
Stoetzel, Ralph E., Chicago, Ill.
Strable Hardwood Co., Oakland, Calif.
Stravs, Carl B., Minneapolis, Minn.
Swan Lake Moulding Co., Klamath Falls, Oreg.
Sweet's Catalog Service, New York, N. Y. (In principle.)
Sweetwater Sash & Door Co., Sweetwater, Tex.
Syracuse University, Syracuse, N. Y.
Taylor, Henry L., St. Petersburg, Fla.
Taylor Construction Corporation, J. D., Syracuse, N. Y.
Taylor Sash & Door Co., Pensacola, Fla.
Taylor, Edward Gray, & Ellis Wing Taylor, Los Angeles, Calif.
Teachout Co., The, Cleveland, Ohio.
Texas Sash & Door Co., Fort Worth, Tex.
Texas Technological College, Department of Architecture and Allied Arts, Lubbock, Tex. (In principle.)
Thompson Co., The, Boston, Mass.
Thorne, Henry Calder, Ithaca, N. Y.
Toledo Door & Sash Co., Toledo, Ohio.
Toombs-Fay Co., Springfield, Mo.
Trexler Lumber Co., Allentown, Pa.
Trojan Cupboard Co., Burbank, Calif.
Tulane Hardwood Lumber Co., Inc., New Orleans, La.
Twin City Hardwood Lumber Co., Saint Paul, Minn.
Underwood Coal & Supply Co., Mobile, Ala.
United Sash, Door & Glass Co., Tucson, Ariz.
United States Plywood Corporation, New York, N. Y., and Cincinnati, Ohio.
Van Bergen, John S., Highland Park, Ill. (In principle.)
Van Winkle Bromley Lumber Co., Paterson, N. J.
Vancouver Plywood & Veneer Co., Vancouver, Wash.
Vickere Lumber Co., T. W., Sheridan, Wyo.
Virginia Polytechnic Institute, Blacksburg, Va.
Vogel, Willis A., Toledo, Ohio.
Voorhees-Walker-Foley & Smith, New York, N. Y. (In principle.)
Walsh, Louis A., Waterbury, Conn.
Wanke Panel Co., Portland, Oreg.
Ward Refrigerator & Manufacturing Co., Los Angeles, Calif.
Warren Bros. Co., Nashville, Tenn.
Washington Veneer Co., Olympia, Wash., and Fort Worth, Tex.
Washington Woodworking Co., Inc., Washington, D. C.
Watertown Sash & Door Co., Watertown, S. Dak.
Welch, Carroll E., Huntington, N. Y.
Welch Sash & Door Co., Port Huron, Mich.
West Coast Plywood Co., Aberdeen, Wash.
Western Door & Sash Co., Oakland, Calif.
Western Hardwood Lumber Co., Los Angeles, Calif.
Weyerhaeuser Sales Co., Tacoma, Wash.
Wheeler Osgood Sales Corporation, Los Angeles, Calif., and Tacoma, Wash.
Wheelock, Inc., E. U., Los Angeles, Calif.
Whissel Lumber Co., Inc., L. N., Buffalo, N. Y.
White Bros., San Francisco, Calif.
Whitmer-Jackson Co., The, Cleveland, Ohio.
Wilbur Lumber Co., West Allis, Wis.
Wildman, Philip, Brooklyn, N. Y.

Wilkinson Co., Inc., Indianapolis, Ind.
Willatsen, Andrew, Seattle, Wash.
Willingham-Tift Lumber Co., Atlanta, Ga.
Willson, Fred F., Bozeman, Mont.
Wilson & Greene Lumber Co., Syracuse, N. Y.
Winslow, Ralph E., Troy, N. Y.
Wischmeyer, Wm. F., Saint Louis, Mo.
Wisconsin's Transfer Yard, Oshkosh, Wis.
Wood Lumber Co., Birmingham, Ala.
Wood Lumber Co., E. K., Los Angeles, Calif.
Wood & Son, Associates, Edward J., Clarksburg, W. Va.
Wright Lumber Co., Inc., New York, N. Y.
Wyman, M. A., Lumber Co., Seattle, Wash.
Young, A. M., Seattle, Wash.
Zimmerman, A. C., Los Angeles, Calif.
Zipp Lumber Co., George T., Petoskey, Mich.
Zoller & Muller, New York, N. Y.

U. S. GOVERNMENT

Agriculture, U. S. Department of, Bureau of Agricultural Chemistry & Engineering, Washington, D. C.
Agriculture, U. S. Department of, Technical Advisory Board, Washington, D. C.
Federal Housing Administration, Technical Division, Washington, D. C.
Federal Works Agency, Public Buildings Administration, Washington, D. C. (In principle.)
Federal Works Agency, United States Housing Authority, Washington, D. C.
Federal Works Agency, Work Projects Administration, Phoenix, Ariz.
Federal Works Agency, Work Projects Administration, San Francisco, Calif.
Federal Works Agency, Work Projects Administration, Southern Calif., Los Angeles, Calif.
Federal Works Agency, Work Projects Administration, Jacksonville, Fla.
Federal Works Agency, Work Projects Administration, Boise, Idaho.
Federal Works Agency, Work Projects Administration, Chicago, Ill.
Federal Works Agency, Work Projects Administration, Division of Operations, Indianapolis, Ind.
Federal Works Agency, Work Projects Administration, Boston, Mass.
Federal Works Agency, Work Projects Administration, St. Paul, Minn.
Federal Works Agency, Work Projects Administration, Butte, Mont.
Federal Works Agency, Work Projects Administration, Oklahoma City, Okla.
Federal Works Agency, Work Projects Administration, Mitchell, S. Dak.
Federal Works Agency, Utah Work Projects Administration, Salt Lake City, Utah.
Federal Works Agency, Work Projects Administration, State of Washington, Seattle, Wash.
Federal Works Agency, Wisconsin Work Projects Administration, Madison, Wis.
Navy Department, Naval Station, Guam, M. I.
Navy Department, Public Works Department, Parris Island, S. C.
Navy Department, Norfolk Navy Yard, Portsmouth, Va.
Northern Rocky Mountain Forest Experiment Station, Missoula, Mont.
Post Office Department, Division of Motor Vehicle Service, Washington, D. C.
Treasury Department, Washington, D. C.
Veterans' Administration, Washington, D. C.
War Department, Washington, D. C.
War Department, U. S. Engineers, Honolulu District, Honolulu, T. H.

COMMERCIAL STANDARDS

CS No.	Item
0-40.	Commercial standards and their value to business (third edition).
1-32.	Clinical thermometers (second edition).
2-30.	Mopsticks.
3-40.	Stoddard solvent (third edition).
4-29.	Staple porcelain (all-clay) plumbing fixtures.
5-40.	Pipe nipples; brass, copper, steel, and wrought iron.
6-31.	Wrought-iron pipe nipples (second edition). Superseded by CS5-40.
7-29.	Standard weight malleable iron or steel screwed unions.
8-33.	Gage blanks (second edition).
9-33.	Builders' template hardware (second edition).
10-29.	Brass pipe nipples. Superseded by CS5-40.
11-29.	Regain of mercerized cotton yarns.
12-40.	Fuel oils (fifth edition).
13-39.	Dress patterns (second edition).
14-39.	Boys' button-on waists, shirts, junior and polo shirts (made from woven fabrics) (second edition).
15-29.	Men's pajamas.
16-29.	Wall paper.
17-32.	Diamond core drill fittings (second edition).
18-29.	Hickory golf shafts.
19-32.	Foundry patterns of wood (second edition).
20-36.	Staple vitreous china plumbing fixtures (second edition).
21-39.	Interchangeable ground-glass joints, stopcocks, and stoppers (fourth edition).
22-40.	Builders' hardware (nontemplate) (second edition).
23-30.	Feldspar.
24-30.	Standard screw threads.
25-30.	Special screw threads.
26-30.	Aromatic red cedar closet lining.
27-36.	Mirrors (second edition).
28-32.	Cotton fabric tents, tarpaulins, and covers.
29-31.	Staple seats for water-closet bowls.
30-31.	Colors for sanitary ware.
31-38.	Wood shingles (fourth edition).
32-31.	Cotton cloth for rubber and pyroxylin coating.

CS No.	Item
33–32.	Knit underwear (exclusive of rayon).
34–31.	Bag, case, and strap leather.
35–31.	Plywood (hardwood and eastern red cedar).
36–33.	Fourdrinier wire cloth (second edition).
37–31.	Steel bone plates and screws.
38–32.	Hospital rubber sheeting.
39–37.	Wool and part wool blankets (second edition).
40–32.	Surgeons' rubber gloves.
41–32.	Surgeons' latex gloves.
42–35.	Fiber insulating board (second edition).
43–32.	Grading of sulphonated oils.
44–32.	Apple wraps.
45–40.	Douglas fir plywood (domestic grades) (fourth edition).
46–40.	Hosiery lengths and sizes (third edition).
47–34.	Marking of gold-filled and rolled-gold-plate articles other than watch cases.
48–34.	Domestic burners for Pennsylvania anthracite (underfeed type).
49–34.	Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
50–34.	Binders' board for bookbinding and other purposes.
51–35.	Marking articles made of silver in combination with gold.
52–35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
53–35.	Colors and finishes for cast stone.
54–35.	Mattresses for hospitals.
55–35.	Mattresses for institutions.
56–36.	Oak flooring.
57–40.	Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings (second edition).
58–36.	Woven elastic fabrics for use in overalls (overall elastic webbing).
59–39.	Woven dress fabrics—testing and reporting (second edition).
60–36.	Hardwood dimension lumber.
61–37.	Wood-slat venetian blinds.
62–38.	Colors for kitchen accessories.
63–38.	Colors for bathroom accessories.
64–37.	Walnut veneers.
65–38.	Wool and part-wool fabrics.
66–38.	Marking of articles made wholly or in part of platinum.
67–38.	Marking articles made of karat gold.
68–38.	Liquid hypochlorite disinfectant, deodorant, and germicide.
69–38.	Pine oil disinfectant.
70–38.	Coal tar disinfectant (emulsifying type).
71–38.	Cresylic disinfectants.
72–38.	Household insecticide (liquid spray type).
73–38.	Old growth Douglas fir standard stock doors.
74–39.	Solid hardwood wall paneling.
75–39.	Automatic mechanical draft oil burners.
76–39.	Hardwood interior trim and molding.
77–40.	Sanitary cast-iron enameled ware.
78–39.	Ground-and-polished lenses for sun glasses.
79–39.	Blown, drawn, and dropped lenses for sun glasses.
80–41.	Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor vehicle laws (after market).
81–41.	Adverse-weather lamps for vehicles (after market).
82–41.	Inner-controlled spotlamps for vehicles (after market).
83–41.	Clearance, marker, and identification lamps for vehicles (after market).
84–41.	Electric tail lamps for vehicles (after market).
85–41.	Electric license-plate lamps for vehicles (after market).
86–41.	Electric stop lamps for vehicles (after market).
87–41.	Red electric warning lanterns.
88–41.	Liquid-burning flares.
89–40.	Hardwood stair treads and risers.

NOTICE.—Those interested in commercial standards with a view toward accepting them as a basis of every-day practice may secure copies of the above standards, while the supply lasts, by addressing the Division of Trade Standards, National Bureau of Standards, Washington, D. C.

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